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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,580	02/27/2002	Adya S. Tripathi	TRIPP030	6017

22434 7590 06/03/2005

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EXAMINER	
AGHDAM, FRESHTEH N	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/084,580	Applicant(s) TRIPATHI ET AL.	
	Examiner Freshteh N. Aghdam	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,4,6,7 and 12-20* is/are allowed.

6)☒ Claim(s) *1,3,5 and 8-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show that figures 2 and 3 are prior art as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

As to figures 2 and 3, the expression "prior art" is not recited to distinguish the drawings of the present invention from the existing devices.

Specification

The disclosure is objected to because of the following informalities:

The section number 411 should change to 441 to match the numbering used in figure 4 at page 12, line 26.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5, 8, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, further in view of Takeuchi et al (US 6,289,046).

As to claims 1, 3, and 5, the admitted prior art teaches an adaptive equalizer comprising an input delay line including delay elements (Fig. 3, means 311-321), the input delay line is configured to receive an input signal (301) and provide intermediate signals, wherein intermediate signals are shifted representations of the input signal (i.e. time or phase shifting as recited in the specification see page 8, lines 27 and 28); a

second output delay line configured to receive intermediate signals and use the first coefficient multiplier to combine intermediate signals into an equalized output signal (i.e. yk). The admitted prior art is silent about a first output delay line including a delay element, the first output delay line configured to receive a first intermediate signal and provide a first gradient element for computing a first coefficient multiplier. Takeuchi et al teaches providing gradient elements (Fig. 16, 280-28N) for computing coefficient multipliers (Fig. 16; Col. 1, Lines 61-67; Col. 2, Lines 1-20). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Takeuchi et al with the admitted prior art in order to remove signal distortion components (Col. 1, Lines 16 and 17).

As to claim 8, the admitted prior art teaches using a LMS (i.e. Least Mean Square) algorithm, signed least mean square equalization, and sign-sign least mean square adaptive equalization (Pg. 10, Lines 2-5).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Takeuchi et al, further in view of Boyd et al (US 6,438,162).

As to claim 9, the admitted prior art and Takeuchi et al teach all the claimed subject matters, except for the adaptive equalizer being implemented using CMOS. Boyd et al teaches an adaptive equalizer implemented using CMOS (title). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Boyd et al with the admitted prior art and Takeuchi et al in order to provide a low cost and low power adaptive equalizer.

As to claim 10, one of ordinary skill in the art would clearly recognize that in adaptive equalizers tap coefficients are initially set to an initial value.

As to claim 11, the admitted prior art teaches gradient elements are components of a gradient vector (Pg. 9, Lines 19 and 20).

Allowable Subject Matter

Claims 2, 4, 6, and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 2, 4, 6, and 7, the prior art of record fails to teach the limitations cited in the claims.

Claims 12-20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 12-20, the prior art of record fails to teach an equalizer comprising an input delay line including delay elements, the input delay line configured to receive an input signal and provide intermediate signals, wherein intermediate signals are shifed representations of the input signal; a first output delay line including delay elements and switches configured to receive intermediate signals, the first output delay line operable to provide gradient elements for computing coefficient multipliers, wherein a first gradient element is provided for computing a first coefficient multiplier when a first switch associated with the first gradient element is selected; a second output delay line

including delay elements and coefficient multipliers configured to receive intermediate signals, wherein the plurality of coefficient multipliers are operable to alter intermediate signals using the plurality of coefficient multipliers calculated using the gradient elements provided by the first output delay line.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam

May 25, 2005

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER

Figure 1

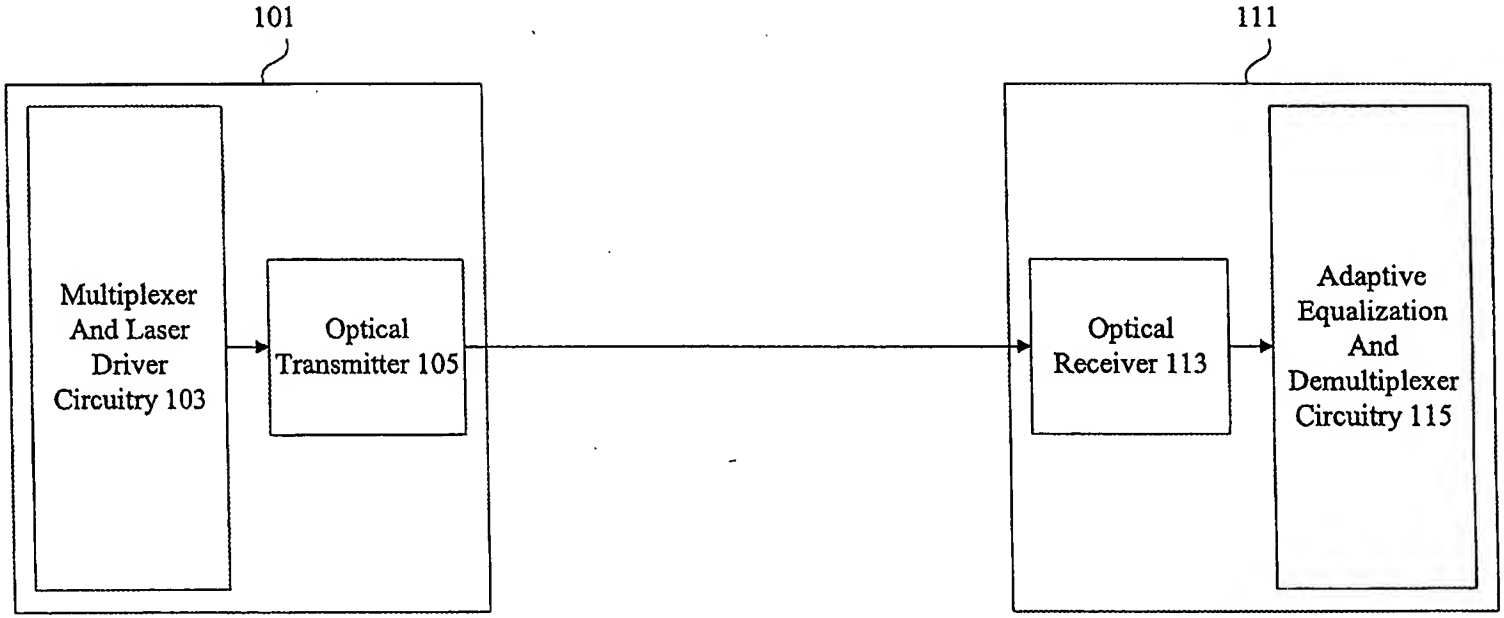

101
111
Multiplexer And Laser Driver Circuitry 103
Optical Transmitter 105
Optical Receiver 113
Adaptive Equalization And Demultiplexer Circuitry 115

Figure 2

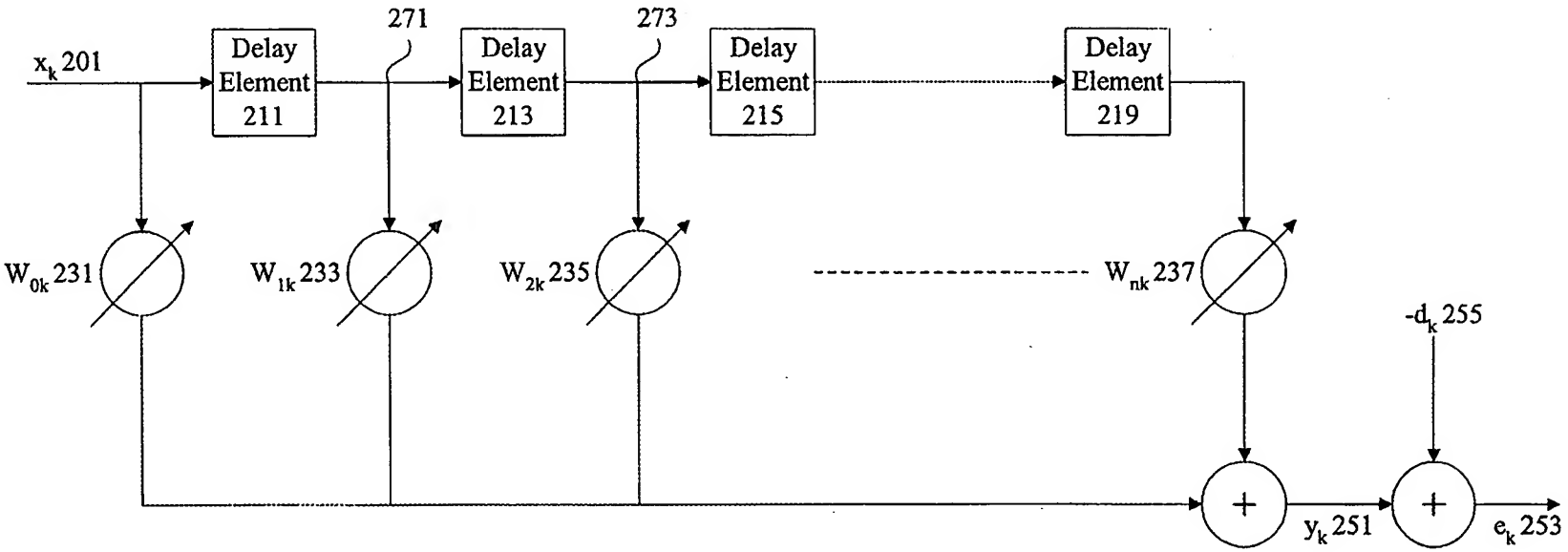
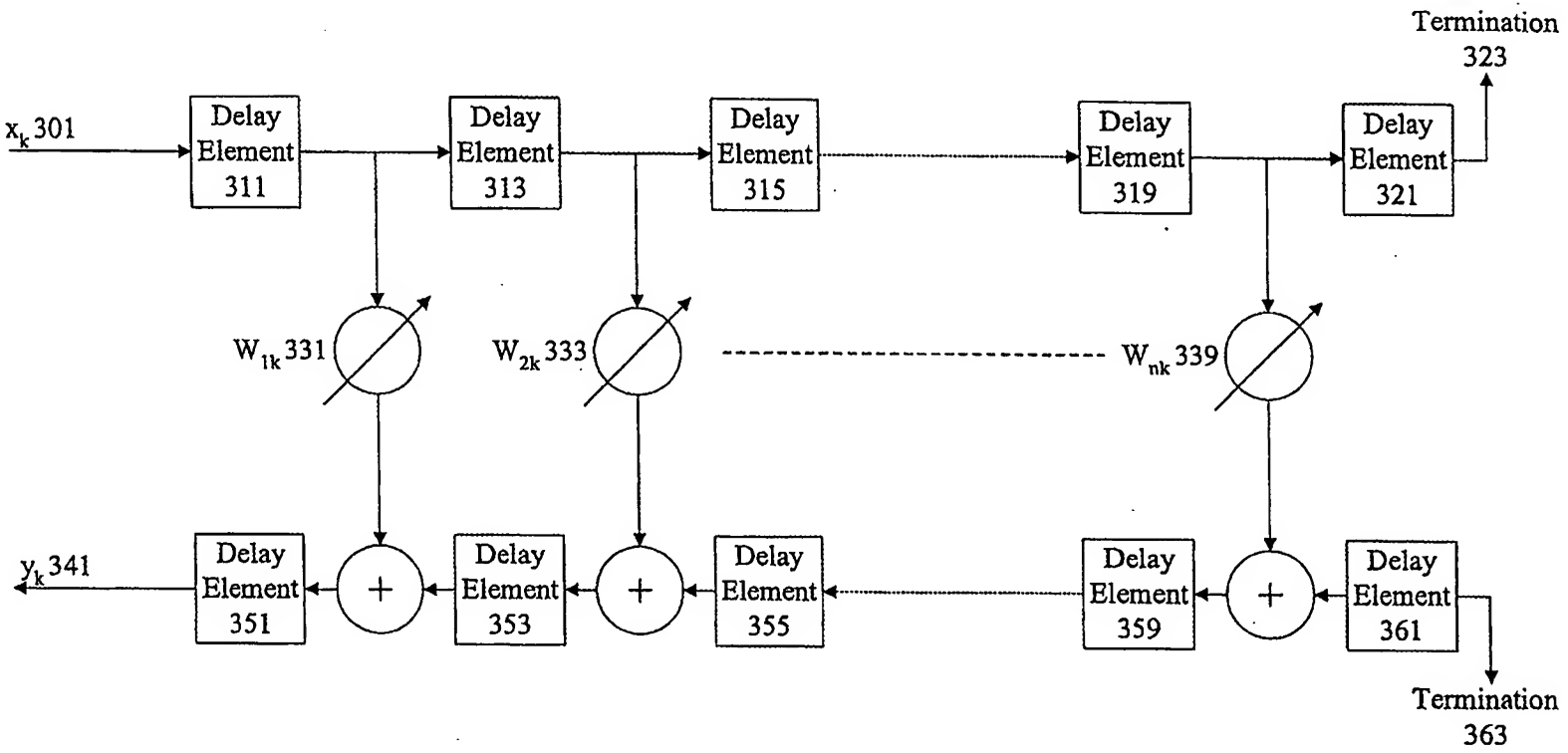


Figure 3


Termination
323
x_k 301
Delay Element 311
Delay Element 313
Delay Element 315
Delay Element 319
Delay Element 321
W_{1k} 331
W_{2k} 333
W_{nk} 339
y_k 341
Delay Element 351
Delay Element 353
Delay Element 355
Delay Element 359
Delay Element 361
Termination
363

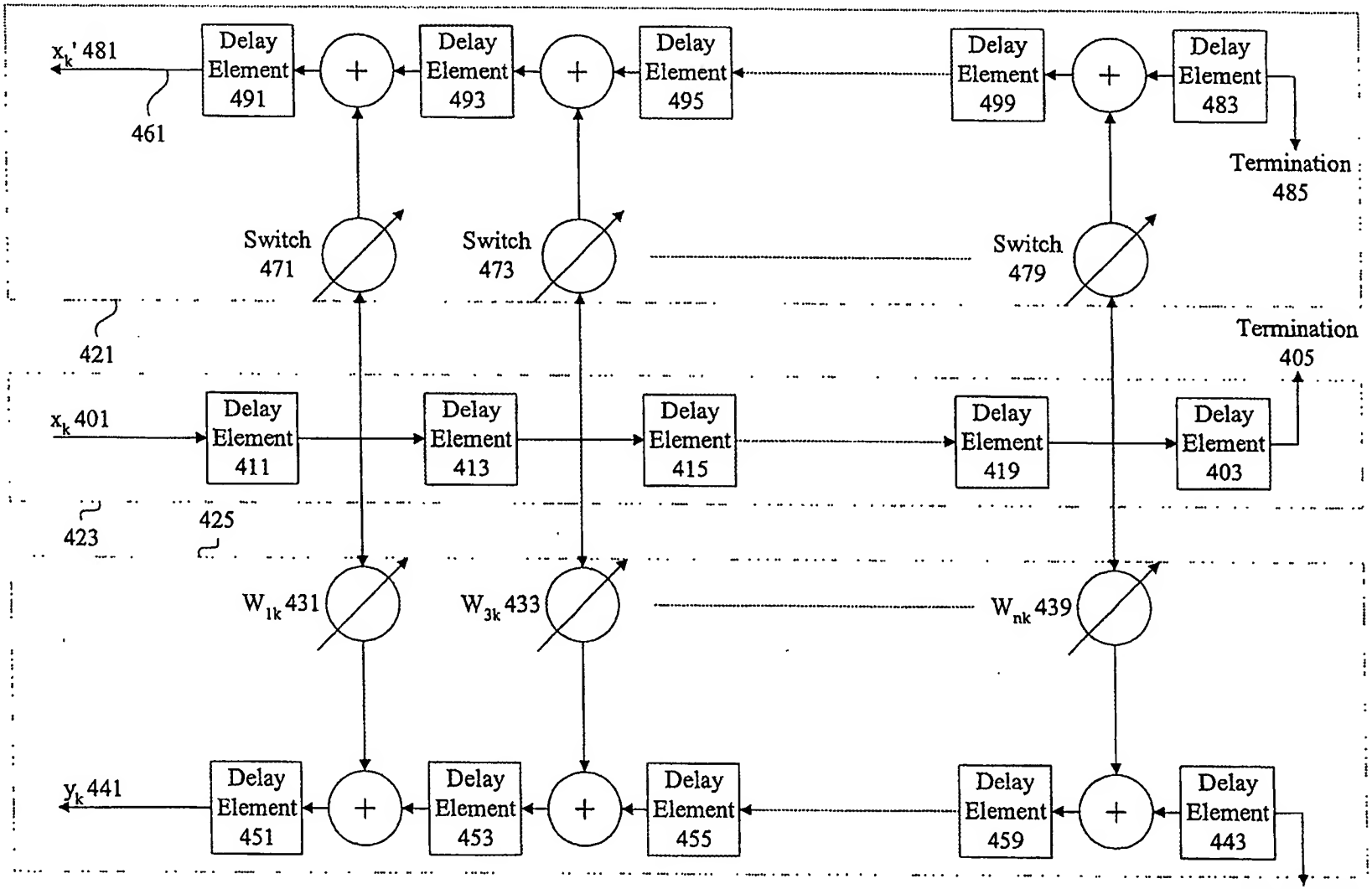


Figure 4

Figure 5

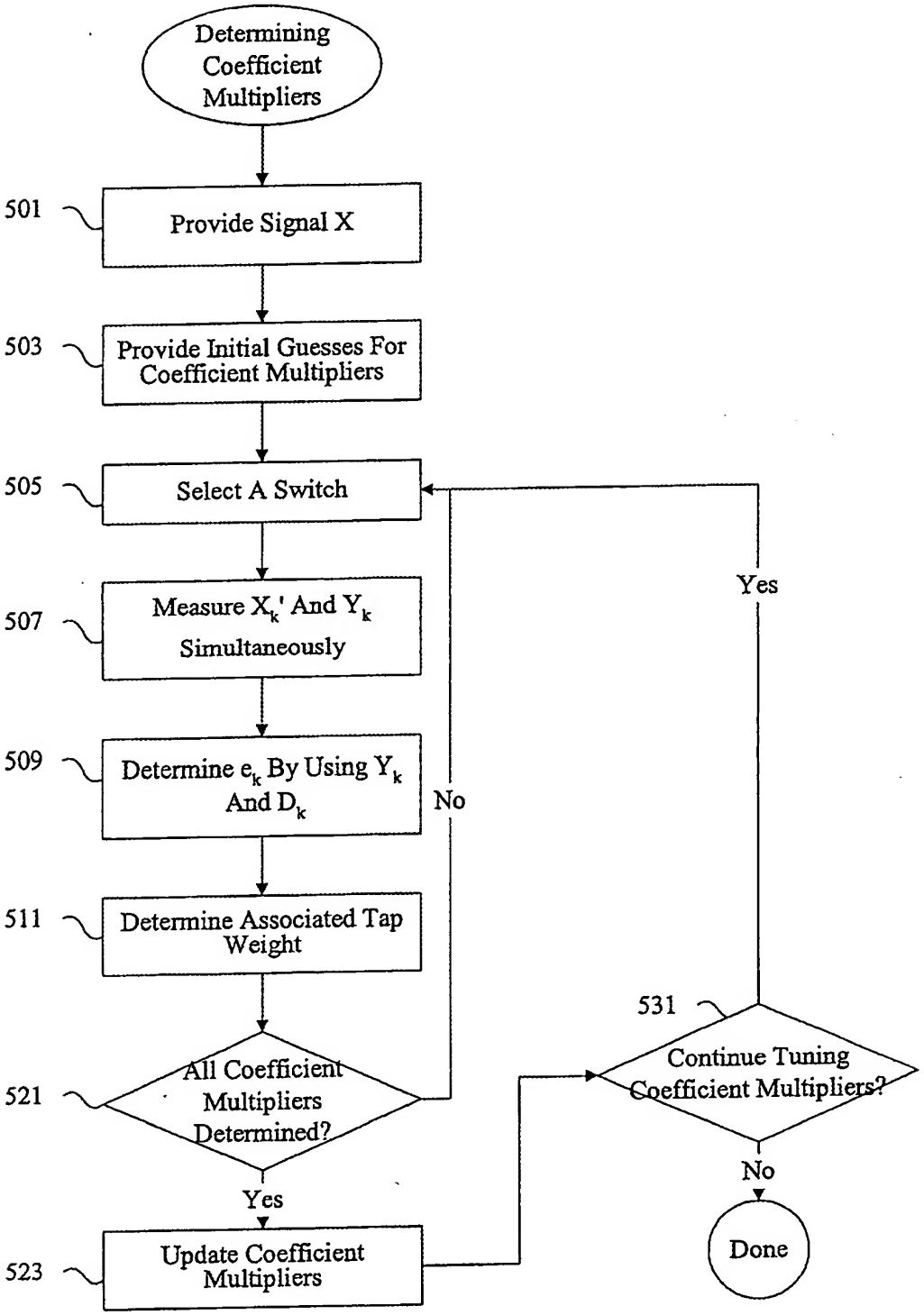

Determining Coefficient Multipliers
501
Provide Signal X
503
Provide Initial Guesses For Coefficient Multipliers
505
Select A Switch
507
Measure X_k' And Y_k Simultaneously
509
Determine e_k By Using Y_k And D_k
511
Determine Associated Tap Weight
521
All Coefficient Multipliers Determined?
No
Yes
523
Update Coefficient Multipliers
531
Continue Tuning Coefficient Multipliers?
Yes
No
Done

Figure 6

	Types Of Transceiver	Optical Transmitter			Optical Mux	Optical Receiver			
		Interface/ Retimer/ Serialize	LD Driver	LDs		Detect + TIA	Post Amp	Adaptive Equalize/ Deserialize	Interface/ Retimer
601	WWDM, Non-Equalized	XAUI/Yes/ No	4 @ 3.125 GBd	4 @ 3.125 GBd	Yes	4 @ 3.125 GBd	4 @ 3.125 GBd	No/No	XAUI/Yes
603	Serial Standard, Non-Equalized	XAUI or XSBI/No/Yes	10 GHz	10 GHz	No	10 GHz	10 GHz	No/Yes	XAUI or XSBI/No
605	Tripath, Standard Serial Tx Optics	XAUI or XSBI/No/Yes	10 GHz	10 GHz	No	2.5 GHz	2.5 GHz	Yes/Yes	XAUI or XSBI/No
607	Tripath With 1/4 Rate Tx & Rx Optics	XAUI or XSBI/No/Yes	2.5 GHz	2.5 GHz	No	2.5 GHz	2.5 GHz	Yes/Yes	XAUI or XSBI/No